1145-14-2577 **Suzanna Stephenson***, Department of Mathematics, Brigham Young University, Provo, UT 84602, and **Natalie Larsen**, **Erik Parkinson**, **Hayden Ringer**, **Tyler Moncur** and **Tyler Jarvis** (jarvis@math.byu.edu). *Fast, stable multivariate numerical rootfinding in a compact region.*

We present a multivariate numerical rootfinding algorithm that finds all real zeros in a given compact region in $\mathbb{C}^n$ of a system of functions. Our method builds on the ideas of Nakatsukasa, Noferini and Townsend of subdividing the original search interval and approximating the functions with Chebyshev polynomials. We then use a variant of the method of Telen and van Barel, finding the roots in each subdomain by computing eigenvectors of the Chebyshev form of certain Möller-Stetter matrices constructed with a well-chosen basis. We compare our algorithm, in terms of accuracy and speed, to other popular numerical rootfinding algorithms. In many instances, this algorithm outperforms all known competitors. (Received September 25, 2018)